

Application No.: 09/438,885
Amendment dated January 23, 2004
Reply to Office Action of October 23, 2003

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Previously Presented) A display device comprising:
a liquid crystal display having a liquid crystal material;
a driver for driving said liquid crystal display; and
a controller for controlling said driver to drive at least a part of said liquid crystal display by selectively using one of either a first drive method and a second drive method which are different from each other in operational principle of said liquid crystal material.
2. (Previously Presented) A display device according to claim 1, wherein the said liquid crystal display is capable of keeping an image, having been formed thereon, without consuming electric power.
3. (Previously Presented) A display device according to claim 2, wherein said liquid crystal material comprises a cholesteric liquid crystal material.
4. (Previously Presented) A display device according to claim 3, wherein said cholesteric liquid crystal material comprises a chiral nematic liquid crystal material.
5. (Previously Presented) A display device according to claim 1, wherein a first time period required to renew an image on said liquid crystal display by using said first drive method is longer than a second time period required to renew an image on said liquid crystal display by using said second drive method.
6. (Previously Presented) A display device according to claim 1, wherein a first electric power consumption required to keep an image on said liquid crystal display

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by using said first drive method is greater than a second electric power consumption required to keep an image on said liquid crystal display by using said second drive method.

7. (Previously Presented) A display device according to claim 6, wherein the image formed on said liquid crystal display by using said second drive method is capable of remaining without consumption of electric power.

8. (Previously Presented) A display device comprising:
a liquid crystal display having a liquid crystal material;
a driver for driving said liquid crystal display; and
a controller for controlling said driver to drive at least a part of said liquid crystal display by selectively using one of either a first drive method and a second drive method,
wherein:
low contrast formation of an image on said liquid crystal display is possible by using said first drive method; and
high contrast formation of an image on said liquid crystal display is possible by using said second drive method.

9. (Previously Presented) A display device according to claim 8, wherein a first contrast of an image displayed on said liquid crystal display by using said first drive method is lower than a second contrast of an image displayed on said liquid crystal display by using said second drive method.

10. (Currently Amended) A display device comprising:
a liquid crystal display which is capable of keeping an image, having been formed thereon, without consuming electric power;
a driver for driving said liquid crystal display; and
a controller for controlling said driver to drive write said image to said liquid crystal display a plurality of times to form at least one image in at least one portion of said liquid crystal display ~~by repeatedly scanning said at least one portion~~.

11. (Currently Amended) A display device according to claim 10, wherein said controller is capable of changing the number of driving times the image is written for forming the at least one image.

12. (Previously Presented) A display device according to claim 10, wherein said liquid crystal display comprises a cholesteric liquid crystal material.

13. (Previously Presented) A display device according to claim 12, wherein said cholesteric liquid crystal material comprises a chiral nematic liquid crystal material.

14. (Previously Presented) A display device according to claim 10, wherein said liquid crystal display comprises a plurality of scan electrodes and a plurality of data electrodes.

15. (Previously Presented) A display device according to claim 14, wherein said controller is capable of controlling said driver so as to execute the steps of:

- (a) addressing a plurality of said scan electrodes and a plurality of said data electrodes to reset an area of said liquid crystal display defined by the plurality of scan electrodes and the plurality of data electrodes;
- (b) addressing at least some of said plurality of said scan electrodes sequentially;
- (c) addressing selected ones of said data electrodes synchronizing with the sequential addressing of the scan electrodes in the step (b); and
- (d) repeating the steps (b) and (c) a plurality of times without interposing the step (a).

16. (Currently Amended) A method for driving a liquid crystal display having a plurality of scan electrodes and a plurality of data electrodes having a memory effect, said method comprising the steps of:

- (a) addressing a plurality of said scan electrodes and a plurality of said data electrodes to reset an area of said liquid crystal display defined by the plurality of scan electrodes and the plurality of data electrodes;

- (b) addressing at least some of said plurality of said scan electrodes sequentially;
- (c) addressing selected ones of said data electrodes synchronizing with the sequential addressing of the scan electrodes in the step (b) to form an image; and
- (d) improving a contrast of said image by repeating the steps (b) and (c) a plurality of times without interposing the step (a).

17. (Currently Amended) A method for driving a liquid crystal display having a plurality of scan electrodes and a plurality of data electrodes, said method comprising the steps of:

- (a) addressing at least some of said plurality of scan electrodes sequentially;
- (b) addressing, in accordance with image data, said data electrodes synchronizing with the sequential addressing of the scan electrodes in the step [(b)] (a) to form an image;
- (c) improving a contrast of said image by repeating the steps (a) and (b) a plurality of times; and
- (d) maintaining said displaying an image that corresponds to said image data on said liquid crystal display without applying electrical voltage to any one of said scanning electrodes and data electrodes.

18. (Previously Presented) A display device according to claim 1 wherein said liquid crystal display can display a two-value image when said second drive method is used.

19. (Previously Presented) A display device according to claim 1 wherein said liquid crystal display can display a multi-tone image when said first drive method is used.

20. (Previously Presented) A display device according to claim 1 wherein each of said first drive method and said second drive method has a resetting period for resetting said liquid crystal display, a selecting period for selecting at least part of said liquid crystal display, and a maintaining period for maintaining a display on said liquid crystal display.

21. (Previously Presented) A display device according to claim 18, wherein said two-value image is formed on said display by said controller selecting one of a first waveform for driving liquid crystal material of said display to a light scattering state and a second waveform for driving liquid crystal material of said display to a light transmitting state, in accordance with image data.

22. (New) A method according to claim 16 wherein repeating the steps (b) and (c) comprises repeating the steps (b) and (c) as long as image data upon which said image is based remains unchanged and a predetermined number of repetitions have not occurred.

23. (New) A method according to claim 17 wherein repeating the steps (a) and (b) comprises repeating the steps (a) and (b) unless said image data has changed or a predetermined number of repetitions have occurred.

24. (New) A display device comprising:
a liquid crystal display having a liquid crystal material with a memory effect;

a driver for applying a pulse voltage to the liquid crystal display to drive the liquid crystal display; and

a controller for controlling said driver, when driving the liquid crystal display to display data thereon, to apply a pulse voltage having a pulse width that is a plurality of times shorter than a pulse width which is necessary for displaying the data on the liquid crystal display.

25. (New) A display device comprising:
a liquid crystal display having a liquid crystal material with a memory effect;
a driver for applying a pulse voltage to the liquid crystal display to drive the liquid crystal display; and
a controller for controlling said driver, when driving the liquid crystal display to display data thereon, to apply a plurality of pulse voltages each having a pulse width

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shorter than a pulse width which is necessary for displaying the data on the liquid crystal display.